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TRIP REPORT

ALASKA LUMBER & PULP CO., WRANGELL

MAY 6, 1981

An insect infestation in the Alaska Lumber and Pulp Company/Wrangell mill was reported on May 5, 1981, by Harold Snoddy (ALP) and Willard Lowe (USFS). Andris Eglitis, entomologist from State and Private Forestry visited the mill on the following day and examined the infested material. This report briefly describes the nature and extent of insect damage in the Wrangell mill yard, and discusses some possible causes for the infestation. In addition, some recommendations are given to help reduce the risk of similar damage in the future.

The insect responsible for damage to spruce and hemlock cants was identified as the striped ambrosia beetle, Trypodendron lineatum (Olivier). Other insects such as the spruce beetle (Dendroctonus rufipennis) and secondary bark beetles were also present on the freshly cut cants, but were not causing any damage. Briefly, the habits of T. lineatum are described as follows: Adults of the striped ambrosia beetle fly in the spring or early summer (May - June) whenever air temperatures exceed 60° F. Early in the season, a day of 70 degree temperatures is likely to produce a much larger flight than days at 61 or 62 degrees F. The beetles are flying in search of new host material which includes logs, stumps, logging slash, recent windthrows, or cants. In order to be suitable for attack and development of ambrosia beetles, this host material must be from 4 to 10 months old; anything more recent or older is usually not attacked due to improper moisture content. Once suitable material has been found, beetles begin tunnelling and releasing pheromones which attract other beetles. The result is a mass attack concentrated on a particular piece of material. The beetles make tunnels up to 3" deep in the sapwood and lay eggs in niches along the way. These tunnels are lined with a fungus which produces a dark stain in the wood surrounding the tunnel and also provides food for developing larvae. The young develop inside the wood and are full-grown by August or September. At this time they emerge as new adults and fly off to

search for overwintering sites in the forest duff. These new beetles will not attack again until the following spring when warm temperatures bring them out of the ground.

On the day of my visit to the mill yard, the temperature reached a high of 71°F -- well above the 60°F threshold level for flight of ambrosia beetles. Since this was the fourth consecutive day of warm, sunny weather, beetles were very active, and could be seen flying throughout the mill yard, crawling on freshly cut cants, and in some cases, boring vigorously into the wood. Prior to initiating tunnels, the beetles seemed to seek out shaded areas and undersides of cants where pallet boards had been inserted between the bundles. Many of these beetles, especially the ones attacking spruce, were tunnelling on the ends or in the cut faces of cants, where there was presumably little or no sapwood. Since this boring had been recently initiated, it was too early to tell if it would result in full-length tunnels or not.

Although the ambrosia beetles were flying and landing throughout the yard, the boring activity was restricted to relatively few bundles of cants. Furthermore, each bundle contained cants with different degrees of attractiveness to ambrosia beetles. Some cants had been attacked in previous years, probably in the woods prior to yarding, as old ambrosia beetle galleries were evident on the cut faces. A few cants were currently being infested, but most were not attacked at all. The infested cants, representing less than 10 % of the total stored in the mill yard, had an average attack density of 20 to 30 boring holes per square foot. The heaviest attacks recorded were 50-60 holes per ft^2 throughout the length of some spruce cants.

The damage resulting from ambrosia beetle tunnelling is always very difficult to assess. Ultimately, losses are determined in the marketplace, which may or may not reflect the true damage done to infested wood. 20 to 30 tunnels per square foot do not affect the strength properties of the wood, nor do they hasten subsequent deterioration of the material. However, those attacks would render a log useless for veneer or for products requiring clear material. In some instances, the market may even look favorably on

such damage, commanding a high price for the infested wood as "wormwood veneer". A realistic assessment of damage requires 1) a statement of the use for which the wood is intended; 2) a definition of the grade of wood acceptable for this product; and 3) a piece-by-piece appraisal of the material (the cants, in this case) to see if each is infested. The last point is important for an accurate damage assessment, since the massive amounts of boring dust from cants under attack may give the impression that all pieces in a bundle are affected.

Two principal factors can be identified as probably being responsible for the ambrosia beetle infestation -- this year's summer weather patterns, and a substantial blowdown during the 1978 autumn windstorm. As mentioned before, ambrosia beetle flights occur only when temperatures reach 60°F. In some years, this may take place in April; in other years, the critical temperatures may not occur until June. Furthermore, the magnitude of a beetle flight depends to some extent on how much above 60° the temperature climbs. Summers such as 1978, 1979, and 1980, when late April-early May temperatures never exceeded 65°, would probably have produced relatively small beetle flights. In summers such as those, the beetle flights would tend to be spread out over several weeks, and each flight would be fairly inconspicuous, since low numbers of beetles are involved. The prolonged warm period in early May of this year, with temperatures in the 70's, probably allowed the majority of the beetle flight to take place over a short time, with more dramatic effects. Temperatures conducive to large beetle flights are not unusual in the Wrangell area. An early summer temperature pattern similar to this year occurred five times during the 1970's. To illustrate this point, the temperatures for those years are shown below, indicating the consecutive days involved:

Year	Temperatures	Dates involved
1981	53-57-61-62-71-70	May 2-7
1976	51-55-60-70-70-72	Apr 25-30
1975	47-51-61-74-74-71	May 6-11
1973	57-54-70-78-61	May 12-16
1972	49-57-66-67-63	May 3-7
1971	45-48-51-65-67	May 8-12

Ambrosia beetle flights would have been significant in each of these years, since temperatures far exceeded the 60 degree level for several days. Since large flights were not reported during the 1970's, the populations were probably low in the area. However, with the windstorm in November of 1978 which resulted in 200 acres of blowdown behind Wrangell, local populations have had an abundance of available host material. It is very likely that beetles attacking cants in the mill yard came from the 1978 and subsequent blowdown. Other less important sources of beetles would include attacked logs stored in the vicinity of the mill during early fall. In August and September, beetles emerge from these logs, and fly to the forest to overwinter in the duff. In general, any infested material must be salvaged or utilized before August of the year in which it is attacked, or beetles will develop, emerge from that material, and hibernate locally, adding to the resident population.

RECOMMENDATION

Since weather patterns conducive to mass beetle flight occur frequently in the Wrangell area, a beetle problem is likely whenever populations are high. If additional blowdown occurs and is not removed from the area, then susceptible material in the mill yard must be protected during times when beetles may be flying. Research in Canada has shown that decked logs in mill yards can be protected completely from ambrosia beetle attack. The method they prescribe involves misting of log decks by means of a permanent sprinkler system built into the storage facility. The system is described in a publication by the Canadian Forestry Service entitled: "Water Misting for Log Protection from Ambrosia Beetles in B. C." by H. A. Richmond and W. W. Nijholt, 1972. B.C. P-4-72 (A Cooperative project by B. C. Forest Products Ltd., Council of Forest Industries). This appears to be the most practical approach available for protecting logs, and may be applicable for cants as well. We suggest contacting the Canadian Forestry Service in British Columbia for details and consultation as to possible implementation of a similar system in the new ALP mill site.

The recommendation given to ALP personnel during this visit was to attempt prevention of attacks on newly cut cants by applying water to the decked material. Water should be applied as long as warm weather continues, and as long as beetles are evident in the mill yard. Protection from boring is afforded only as long as the wood remains thoroughly wet -- once the material dries, beetles will begin boring, and cannot be stopped at that point. It was recommended that material already under attack not be watered, but be left as "bait" to attract the flying beetles away from unattacked cants.

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